

**THAT WHICH IS CLAIMED IS:**

1. An electro-fluidic device comprising:
  - a substrate having at least one substrate fluid passageway therein;
  - at least one substrate electrical conductor carried by said substrate;
  - an external interface spaced from said substrate and comprising at least one interface electrical conductor; and
  - at least one electro-fluidic interconnect extending between said substrate and said external interface and comprising
    - an interconnect body having at least one interconnect fluid passageway extending therethrough and connected to said at least one substrate fluid passageway, and
    - at least one interconnect electrical conductor carried by said interconnect body connecting said at least one substrate electrical conductor and said at least one interface electrical connector.

2. The electro-fluidic device of Claim 1 wherein said interconnect body comprises at least one sidewall, and wherein said at least one interconnect electrical conductor is enclosed within said at least one sidewall.

3. The electro-fluidic device of Claim 1 wherein said at least one interconnect electrical conductor comprises a printed conductor.

4. The electro-fluidic device of Claim 1 wherein said interconnect body comprises a low temperature co-fired ceramic (LTCC).

5. The electro-fluidic device of Claim 1 wherein said interconnect body has a substantially rectangular lateral cross-sectional shape.

6. The electro-fluidic device of Claim 1 wherein said interconnect body has a lateral cross-sectional area of less than about 10 mm<sup>2</sup>.

7. The electro-fluidic device of Claim 1 wherein the at least one interconnect fluid passageway comprises a plurality of interconnect fluid passageways.

8. The electro-fluidic device of Claim 1 wherein said at least one interconnect electrical conductor comprises a plurality thereof.

9. The electro-fluidic device of Claim 1 further comprising a microfluidic device carried by said substrate, electrically connected to said at least one substrate electrical conductor, and in fluid communication with the at least one substrate fluid passageway.

10. The electro-fluidic device of Claim 9 wherein said microfluidic device comprises a micro-rotary engine.

11. The electro-fluidic device of Claim 1 further comprising an electronic device carried by said substrate electrically connected to said at least one substrate electrical conductor and in thermal communication with the at least one substrate fluid passageway.

12. An electro-fluidic device comprising:  
a substrate having at least one substrate fluid passageway therein;

a plurality of substrate electrical conductors carried by said substrate;

an external interface spaced from said substrate and comprising a plurality of interface electrical conductors;

at least one electro-fluidic interconnect extending between said substrate and said external interface and comprising

a low temperature co-fired ceramic (LTCC) interconnect body having at least one interconnect fluid passageway extending therethrough and connected to said at least one substrate fluid passageway, and

a plurality of interconnect electrical conductors carried by said interconnect body connecting said substrate electrical conductors and said interface electrical connectors; and

a microfluidic device carried by said substrate, electrically connected to said substrate electrical conductors, and in fluid communication with the at least one substrate fluid passageway.

13. The electro-fluidic device of Claim 12 wherein said interconnect body comprises at least one sidewall, and wherein at least one of said interconnect electrical conductors is enclosed within said at least one sidewall.

14. The electro-fluidic device of Claim 12 wherein said interconnect electrical conductors comprise printed conductors.

15. The electro-fluidic device of Claim 12 wherein said interconnect body has a substantially rectangular lateral cross-sectional shape.

16. The electro-fluidic device of Claim 12 wherein said interconnect body has a lateral cross-sectional area of less than about 10 mm<sup>2</sup>.

17. The electro-fluidic device of Claim 12 wherein the at least one interconnect fluid passageway comprises a plurality of interconnect fluid passageways.

18. The electro-fluidic device of Claim 12 wherein said at least one interconnect electrical conductor comprises a plurality thereof.

19. The electro-fluidic device of Claim 12 wherein said microfluidic device comprises a micro-rotary engine.

20. A method for interconnecting a substrate having at least one substrate fluid passageway therein and at least one substrate electrical conductor carried thereby, and an external interface spaced from the substrate and comprising at least one interface electrical conductor, the method comprising:

connecting at least one electro-fluidic interconnect between the substrate and the external interface, the at least one electro-fluidic interconnect comprising an interconnect body having at least one interconnect fluid passageway extending therethrough to be connected to the at least one substrate fluid passageway, and at least one interconnect electrical conductor carried by the interconnect body for connecting the at least one substrate electrical conductor and the at least one interface electrical connector.

21. The method of Claim 20 wherein the interconnect body comprises at least one sidewall, and wherein the at least one interconnect electrical conductor is enclosed within the at least one sidewall.

22. The method of Claim 20 wherein the at least one interconnect electrical conductor comprises a plurality of printed conductors.

23. The method of Claim 20 wherein the interconnect body comprises a laminated stack of low temperature co-fired ceramic (LTCC) layers.

24. The method of Claim 20 wherein the interconnect body has a lateral cross-sectional area of less than about 10 mm<sup>2</sup>.

25. The method of Claim 20 wherein the at least one interconnect fluid passageway comprises a plurality of interconnect fluid passageways.